Boost operational efficiency with Vitria VIA AIOps for Cisco Network Automation

Cisco Knowledge Network Webinar

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Today's Presenters

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VITRIA

Complexity is outpacing human capabilities

1. Adoption and integration of digital technologies changes how services are delivered to end customers.

2. Traditional siloed operations support system (OSS) stacks:
   - Constrain operations and
   - Can’t deliver an optimal customer experience

3. AIOps dramatically changes the service operations effectiveness:
   - Extracting actionable insights
   - Automating tasks and processes
   - Reducing MTTR

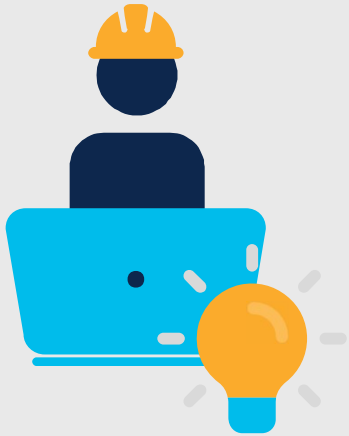
Business challenges

- Delivering customer experience expectations and committed service levels
- Managing mass-scale infrastructure complexity
  - Interdependent technology layers, domains, and applications with more virtualization and microservices
  - Explosive data volumes and disparate data formants
- Detecting and resolving service events before business or customer experience impact
- Traditional fault and performance management systems rely upon siloed monitoring tools
  - Interrelated issues across systems result in multiple tickets being opened and separate teams taking actions, wasting time and resource
  - Finding true cause is slow and labor intensive

Service disruption and degradation

- Impacts revenue and customer loyalty
- Increases the volume of support contacts and technician visits, which necessitates staff augmentation

The success of IT operations is measured in how proactively and quickly service issues are resolved.



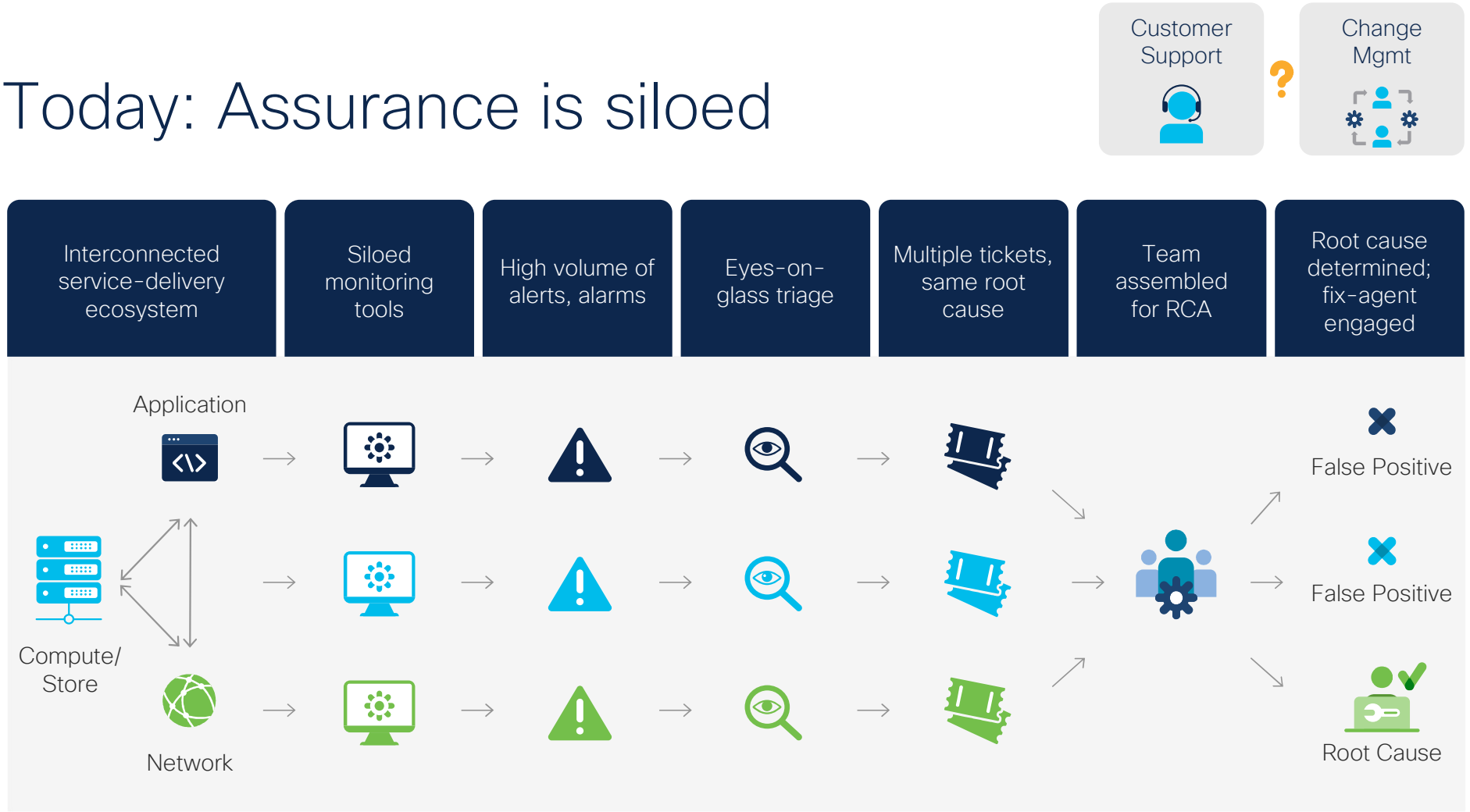
What if you could?

- Accelerate the detection and resolution of service issues within and across service domains?
- Reduce noise and detect service anomalies earlier?
- Automatically distinguish between symptoms and root cause and identify the customer populations and infrastructure impacted?
- Prioritize based on business and service impact?
- Automate service assurance through a model-driven approach?
- Do all this with integration to your existing monitoring tools and backend management systems?

Addressing AIOps Complexity

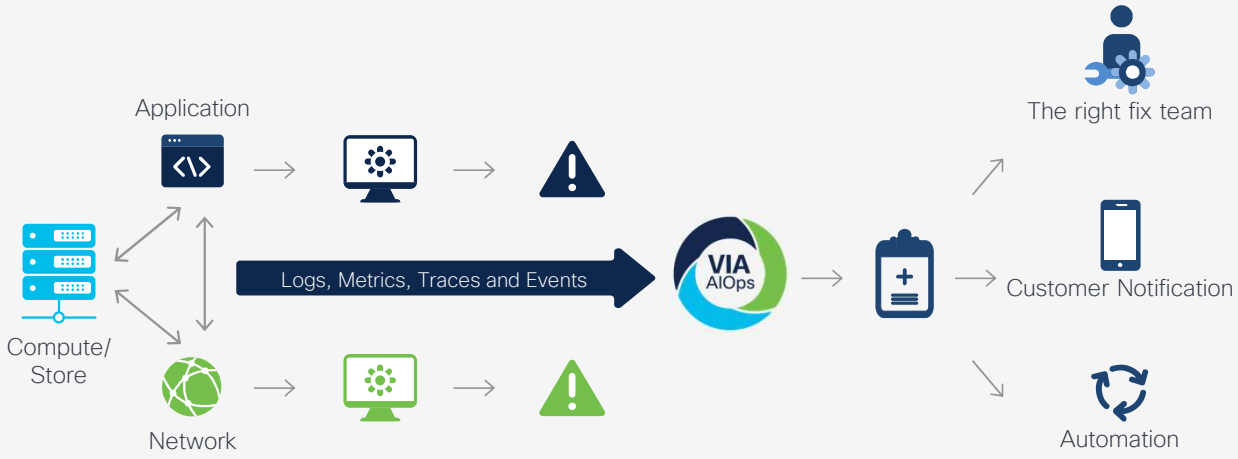
Perception	VIA AIOps Reality
AIOps deployments take too long to add value.	*Tier 1 NA ISP*: 60-day bake-off, immediate production in AWS, >90% detect and act prior to customer experience impact *Tier 1 NA MSO*: 90-day pilot, 8 weeks for 2 regions, nationwide in 6-months, measured reduction in customer impacts
Data ingest is rigid in AIOps applications	VIA's flexible ontology model allows for ingestion and enrichment across a *wide variety of data sources, types and schemas* (time-series counters, gauges, events, faults, alerts, topology)
AIOps is just another screen or queue to manage	VIA AIOps is a *non-disruptive* deployment with northbound interfaces that integrate with existing workflows to make current tools *smarter and faster*

Today: Assurance is siloed



Vitria's VIA AIOps Delivers end-to-end service assurance

- Ingests asynchronous and time series events from the infrastructure, application, and network
- Signals from the source or monitoring tools are correlated and analyzed to determine root cause
- Actions are prescribed with definition of the services and customers that are impacted



Accelerates the time to detect and resolve service-impacting events across service domains

VIA AIOps: cross-domain product performance management

- Aggregates and correlates resource and service assurance events and logs
- Optimizes fault, performance, and change management processes across customer, product, service and resource domains
- Leverages artificial intelligence, machine learning, and advanced analytics to identify faults, performance, and customer experience issues faster
- Identifies probable root cause and the impacted population for remediation
- Integrates with existing backend systems and enables process automation

Observe
Ingest, Enrich and structure massive real-time data feeds

Analyze
Detect anomalies in metrics streams, Correlate anomalies and alerts, Evaluate and prioritize

Act
Identify likely cause, Trigger automated actions, Alert responsible parties

Vitria Overview

FOCUS
- Full stack AIOps
- Digital Operations
- AI/ML
- Real-time analytics
- No-code, Big Data development env.

INDUSTRIES
- Telco/Cable
- IoT/Utilities
- Financial Services
- Supply Chain

HEADQUARTERS
- Menlo Park, CA

OFFICES:
- US, UK, Spain, Japan, China
- Partners globally

VIA AIOps: enabling the new, leaner and customer-driven operations. Through its full stack observability & advanced analytics, VIA AIOps ignites organizations' journeys towards customer experience excellence.

A leading network operator used VIA to reduce service-impacting incidents

Problem

Operator averaged more than 450 incidents/ month on a single service, each manually worked

Solution

Learn baselines and dependencies to automate detection and reduce false positives

Results

Reduced incidents to less than 5 per day, improved availability by 60%, reduced person-hours by 50%

Leading network operator

Hundreds of operations staff

VIA reduced incidents by 65%

A video service provider improves their customers' digital experience with VIA

Problem

Over 140,000 failed application access attempts per day caused customer dissatisfaction

Solution

Correlate app failures to network elements: root cause, auto-triage, proper incident assignment

Results

Removed 11M failures per year and ~250k customer support calls per year (equivalent to 20 full-time staff and $2.3M/year)

Video service provider

Over 30M subscribers

VIA reduced failure rate by 28%

North American cable operator used VIA AIOps to reduce technician visits

Problem

DevOps, CI/CD, and constant network upgrades caused unplanned and undetected outages

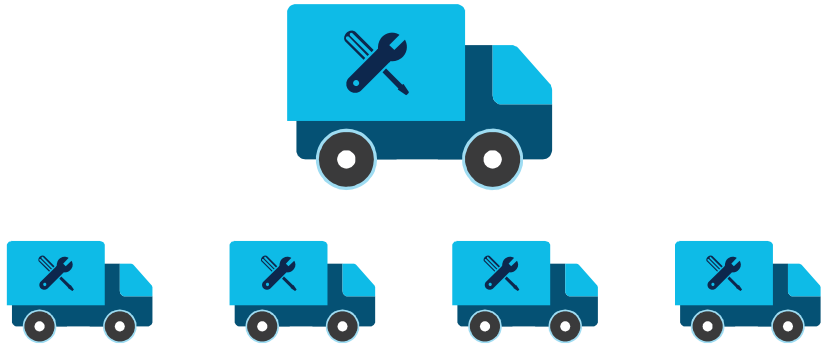
Solution

Auto-detect events, discover dependencies, and correlate to experience KPIs

Results

Change-related service impact is immediately detected, and truck rolls are avoided

Top-tier cable operator

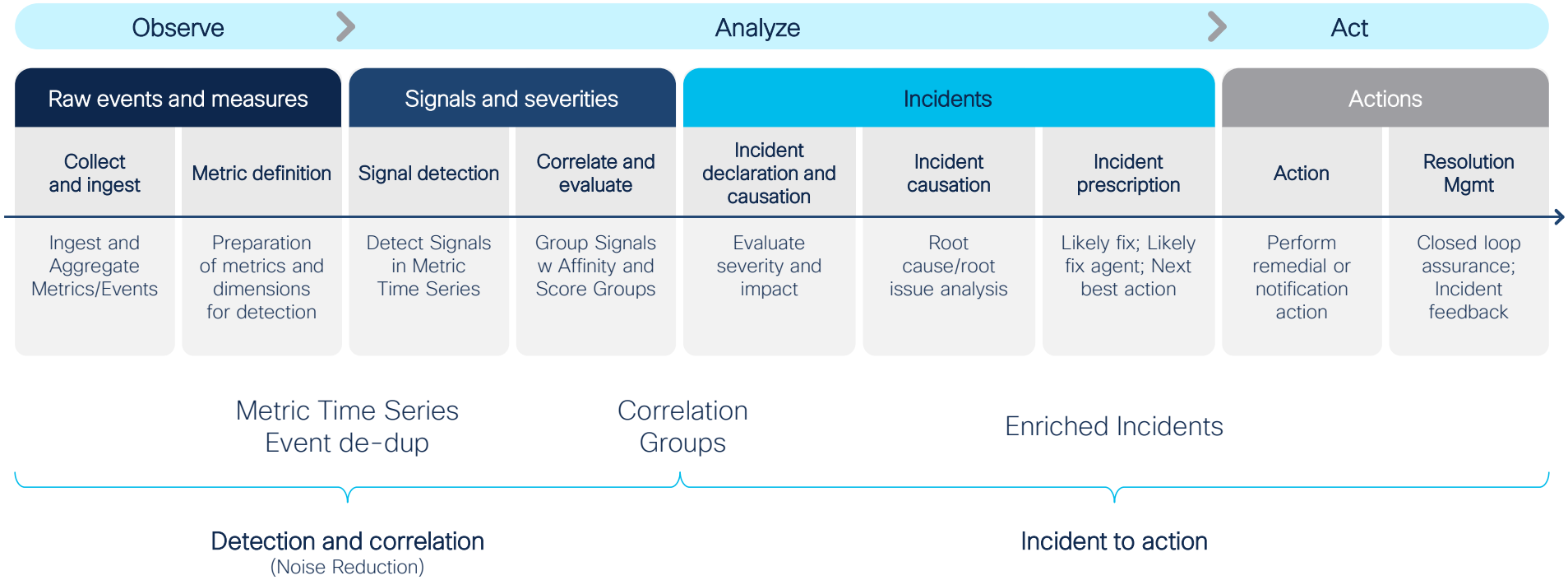


Millions of technician visits

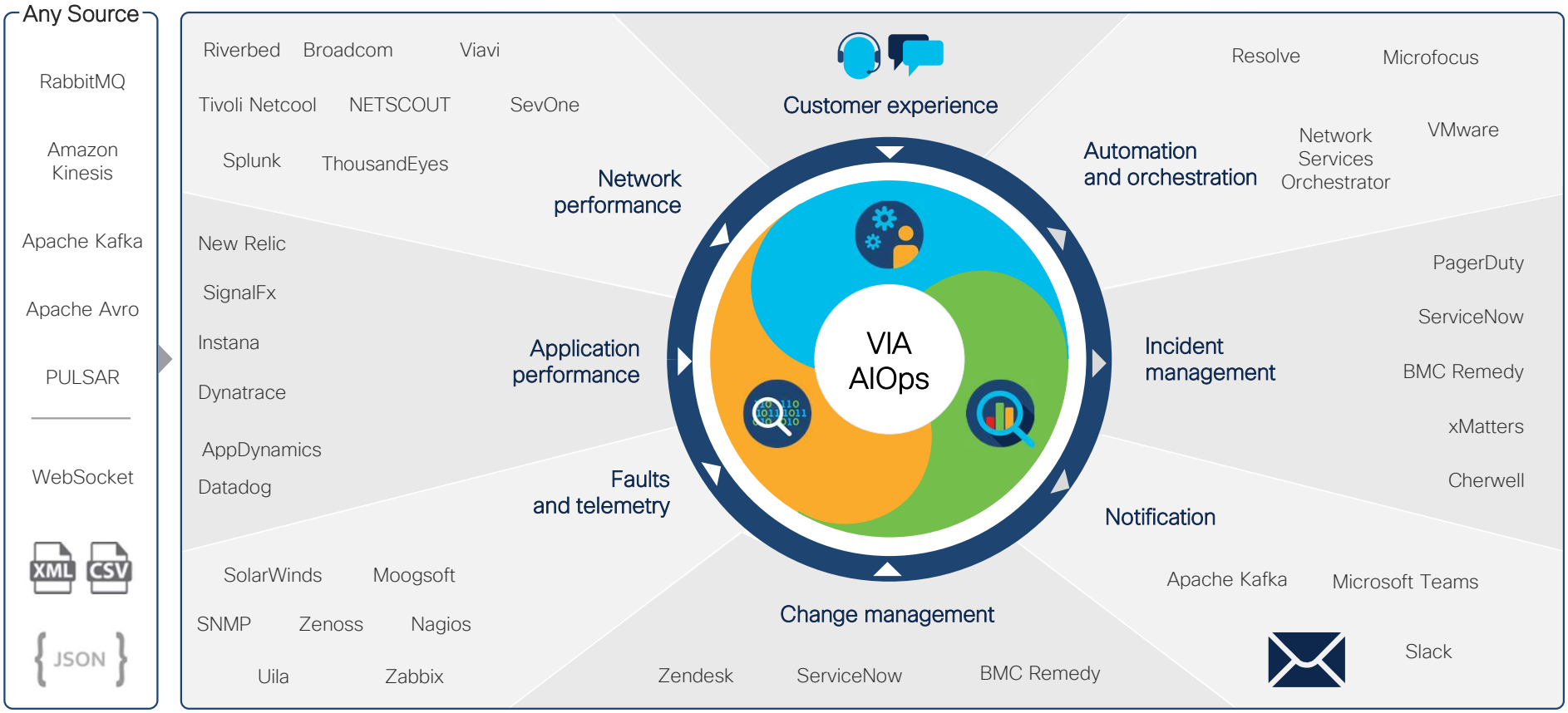
VIA Identified 200k+ Tech visits (at a cost of $16M)

Demo

Incident pipeline: From noise to action



VIA integration ecosystem



VIA Signal Onboarding
Enables data to be immediately available in the UI

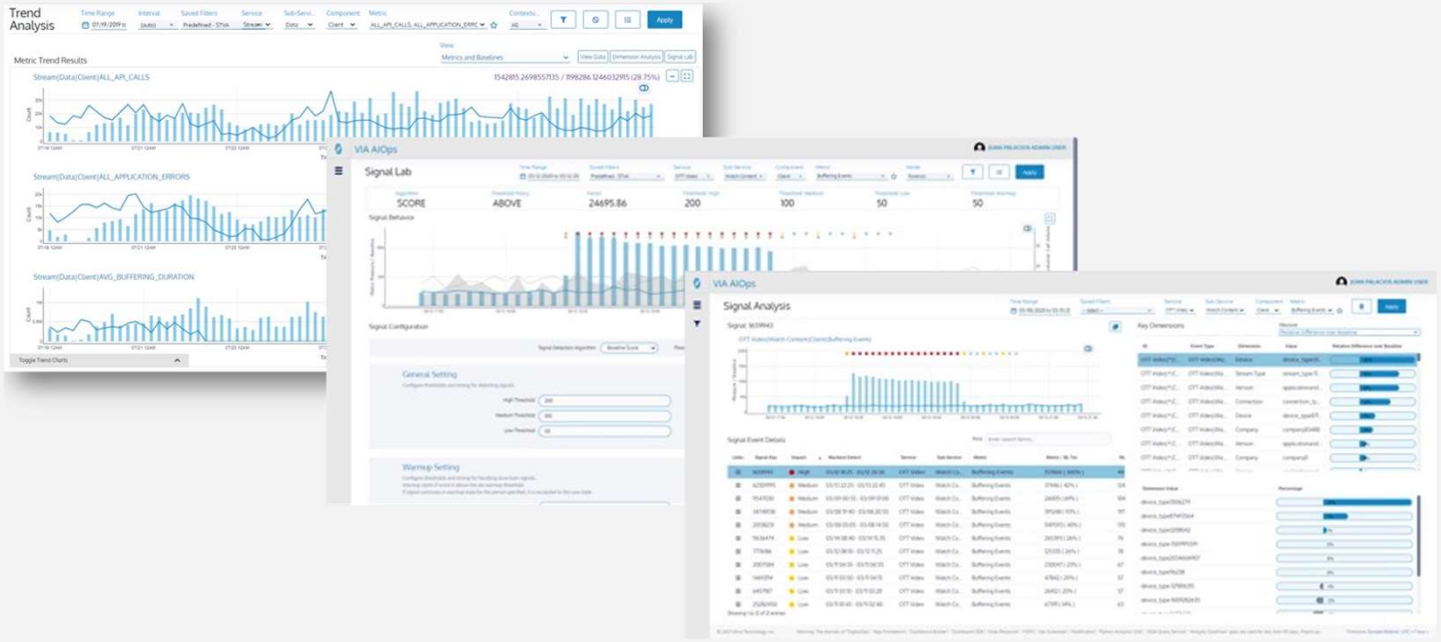
Ingest Methods

Collectors

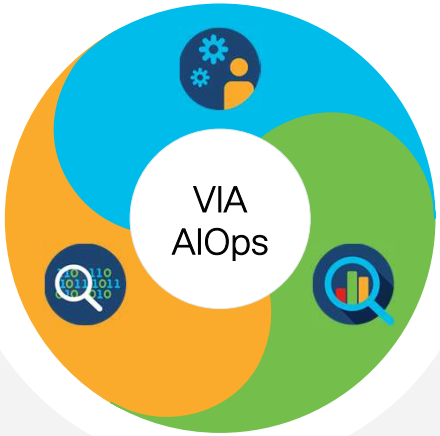
Connectors

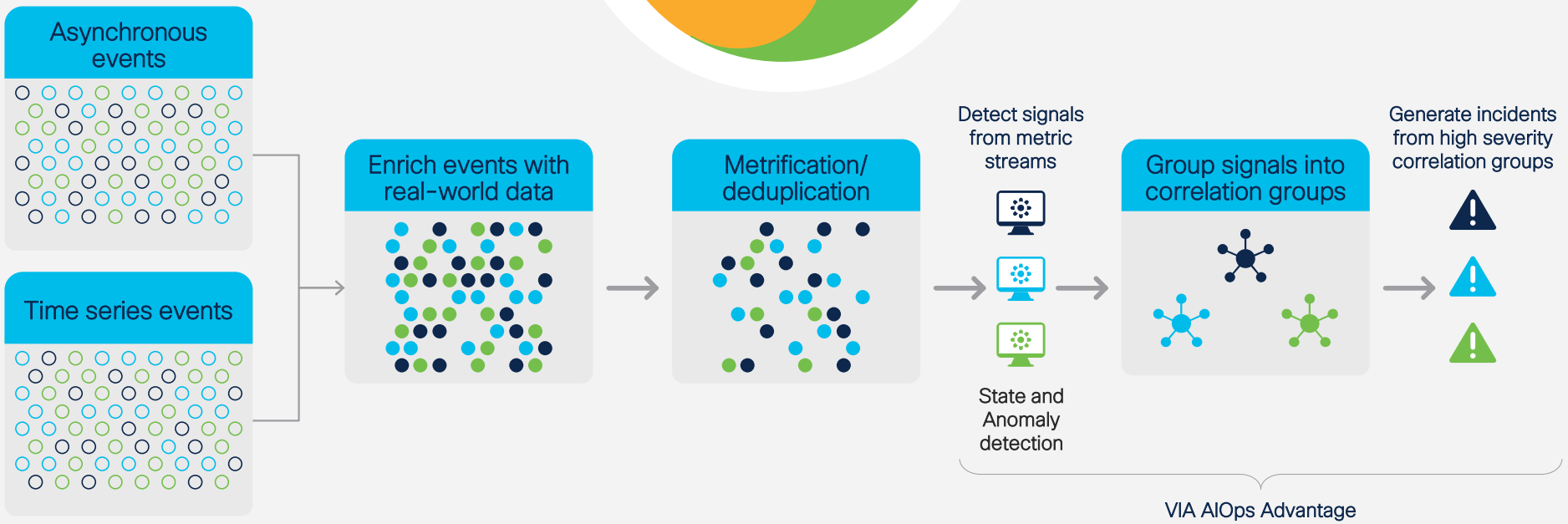
VIA SO GUI

VIA low-code toolkit

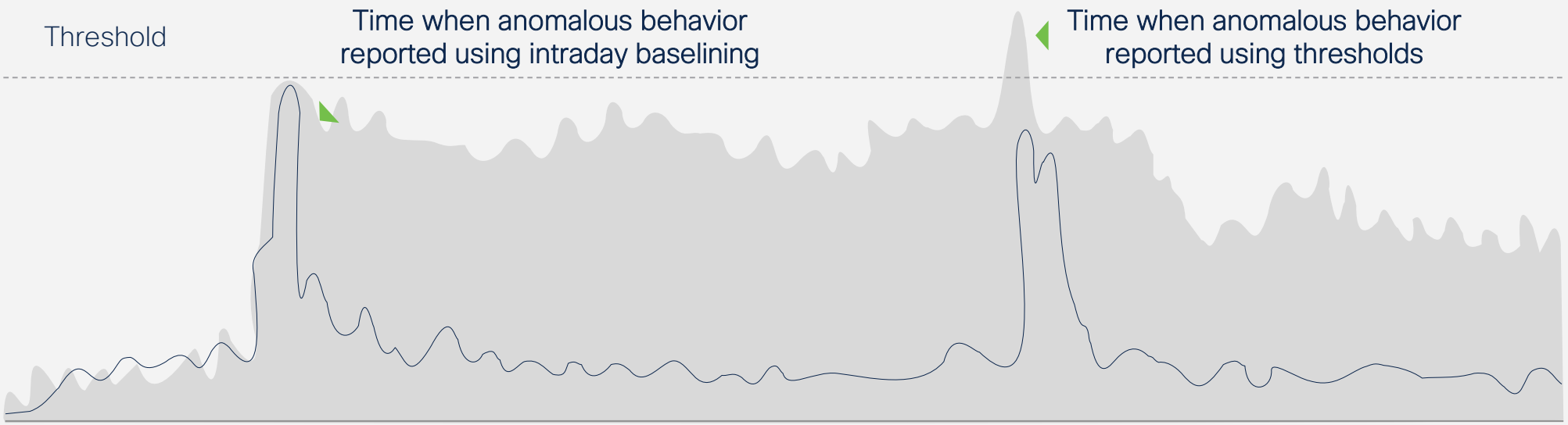


Data value pipeline





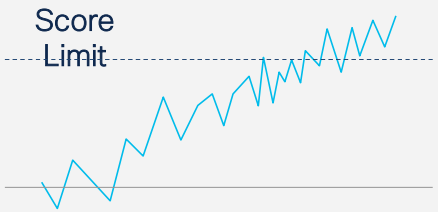
Simple thresholds are sometimes too simple



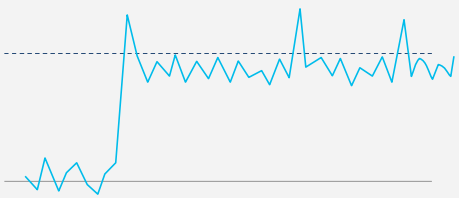
All metrics are NOT created equally. Seasonality, random occurrences and change management are just some of the reason why simple thresholds do not work in all cases.

Each metric has unique behavior

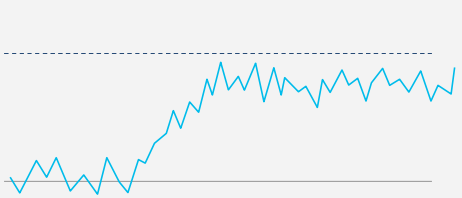
Slow Riser
Early detection



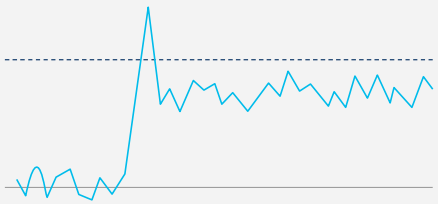
Multiple peaks and "under the radar"
Detected as a single incident



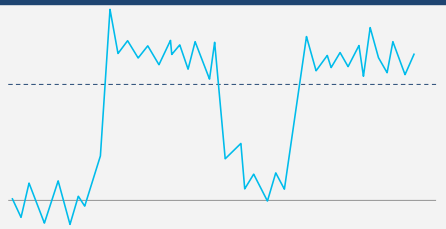
"Under the radar"
Threatening state change detected



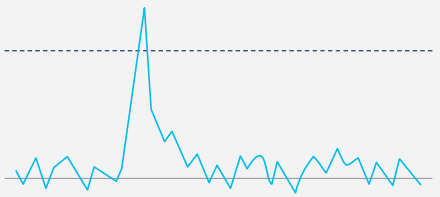
Multiple peaks and "under the radar"
True positive-detected



Transient dropouts
Detected as single incident



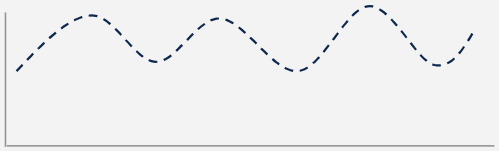
Transient anomaly
False positive-no incident



VIA employs stochastic anomaly detection as different metrics exhibit different behaviors over time. This reduces both false positives and false negatives.

Determine the baseline

Seasonal, dynamic baseline



Constant (or 0) baseline

Asynchronous event stream (faults, alarms)

1

VIA analyzes each event and metric stream to determine the proper baseline type (e.g., seasonal, constant)

2

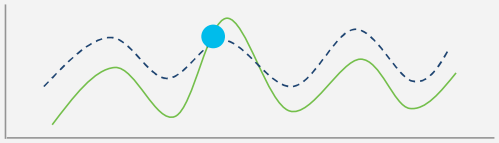
VIA then sets the most efficient baseline to reduce false positive while avoiding false negatives (missed opportunities)

3

Faults and alarms are treated as both asynchronous events as well as metrified for time-series based analysis

Efficiently detect signals

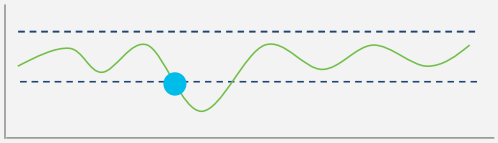
Anomaly detection w/Dynamic baseline >



1

Metrics with seasonal baselines leverage score-based algorithms across moving windows of time

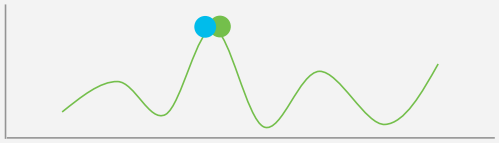
Threshold-based Detection >



2

Metrics with non-seasonal baselines use simple thresholds to detect signals

Faults and alarms >

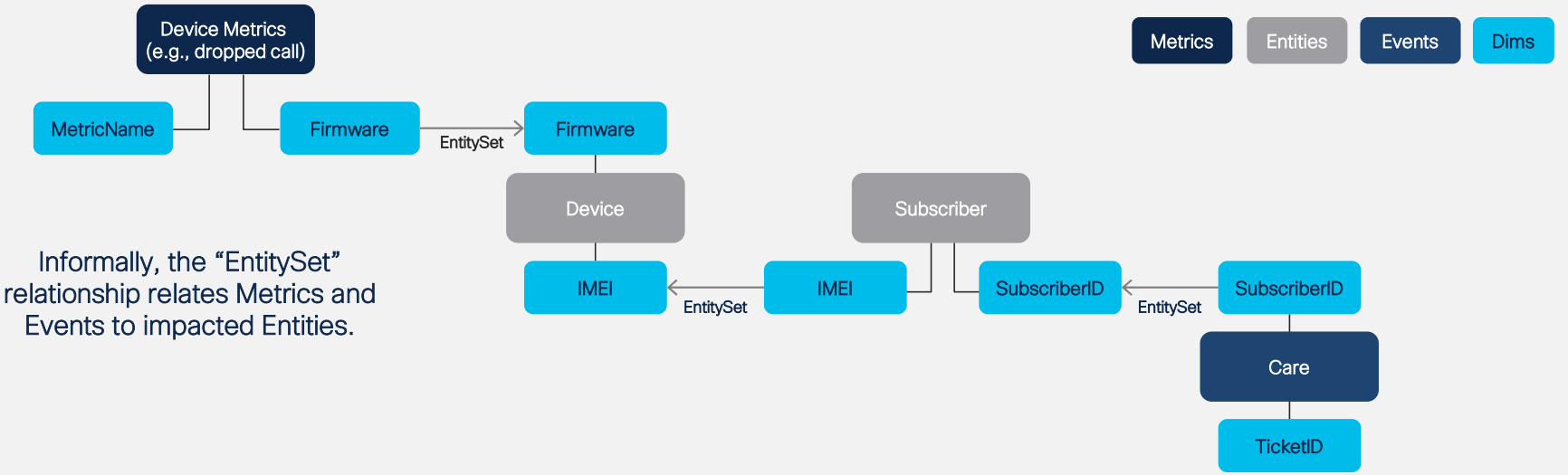


3

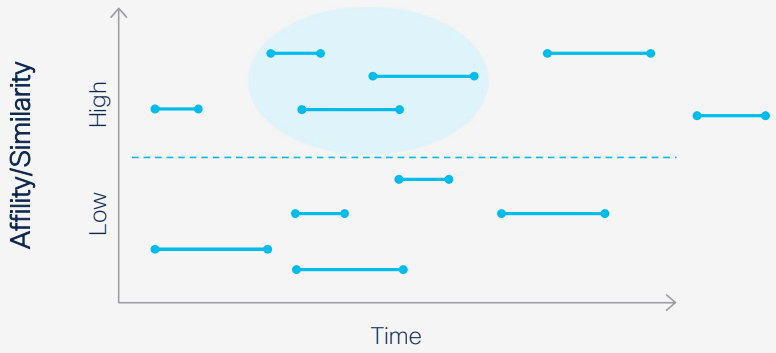
Faults and alarms are treated as signal by definition and are then correlated with metric time-series for further context

Ontology and service dependencies

- Ontology is used in affinity analysis to support the grouping of signals across components and service layers.
  - Ontology is information on the logical, topical and physical characteristics across and between devices, infrastructure, customers, and all other system components and entities
  - Provides deeper and richer data to accelerate analysis and diagnosis across the system and subsystems
  - VIA's AI/ML can automatically discover the system ontology



Correlation



- Once detected, Signals are then organized into Correlation Groups
- These Groups are based on both temporal overlap and affinity scores
- The top cluster of incidents are grouped together because they have both high affinity and temporal overlap

Dynamic look-back windows based on behavioral changes properly identify and correlate early triggering events.

Probable cause

Several algorithms are used in Probable Cause Analysis. VIA uses a ranking score based on the combination of Severity, Eccentricity, and Entropy.

Severity is a measure of degree that a system component or element is detrimentally affected by an incident.

Eccentricity is a measure of "disproportional impact" by an incident and is determined by comparing the affect of an incident on a given component as compared to its peer components.

Entropy, informally, is a measure of disorder in a system (or component), with a perfectly running system having near 0 entropy and a completely dysfunctional system (or component) having high entropy.

A component that exhibits both high severity and high eccentricity, i.e., is the most disproportionately affected by the fault or performance issue as compared to its peers, has the highest entropy. **Components with high entropy have very high diagnostic value in determining root cause.**

Automation drive value

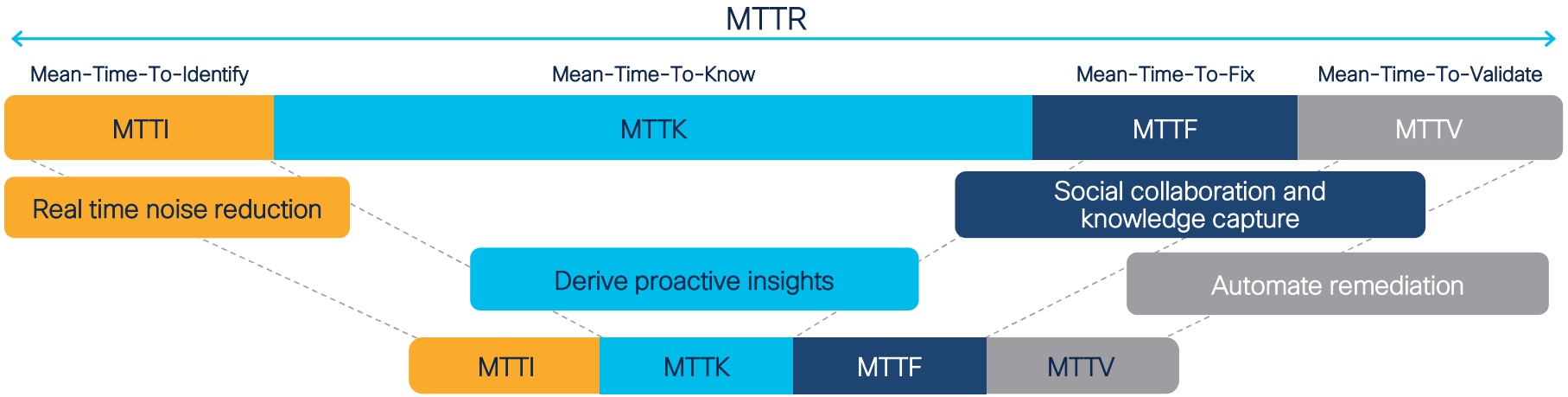
From collaboration to closed-loop assurance

Use Case	Description	Value
Collaboration	M2H notification to email or collaboration tool (e.g., Webex Teams, Slack)	Fully contextualized Incident details are shared w/ triage team
Intelligent Routing	M2H contextually-aware ticket creation (direct work to network vs. apps team)	Reduces up to 90% of triage time through automated RCA
Runbook/Playbook	M2M action that triggers a script or DevOps pipeline	Restore service quicker through simple automations
Orchestration	M2M communication of context necessary for orchestrator (e.g. Cisco NSO) to take action	Leverage capabilities of SDN/NFV and cloud-native environments
Closed-loop Assurance	Prescribe action through ticket creation, monitor KPIs to assurance normal state is resumed, close ticket	Reduce eyes-on-glass assurance

Action creation process

Reduce the incident lifecycle

VIA AIOps adds value across the entire ecosystem



Fewer
customer support contacts annually

Fewer
technician visits

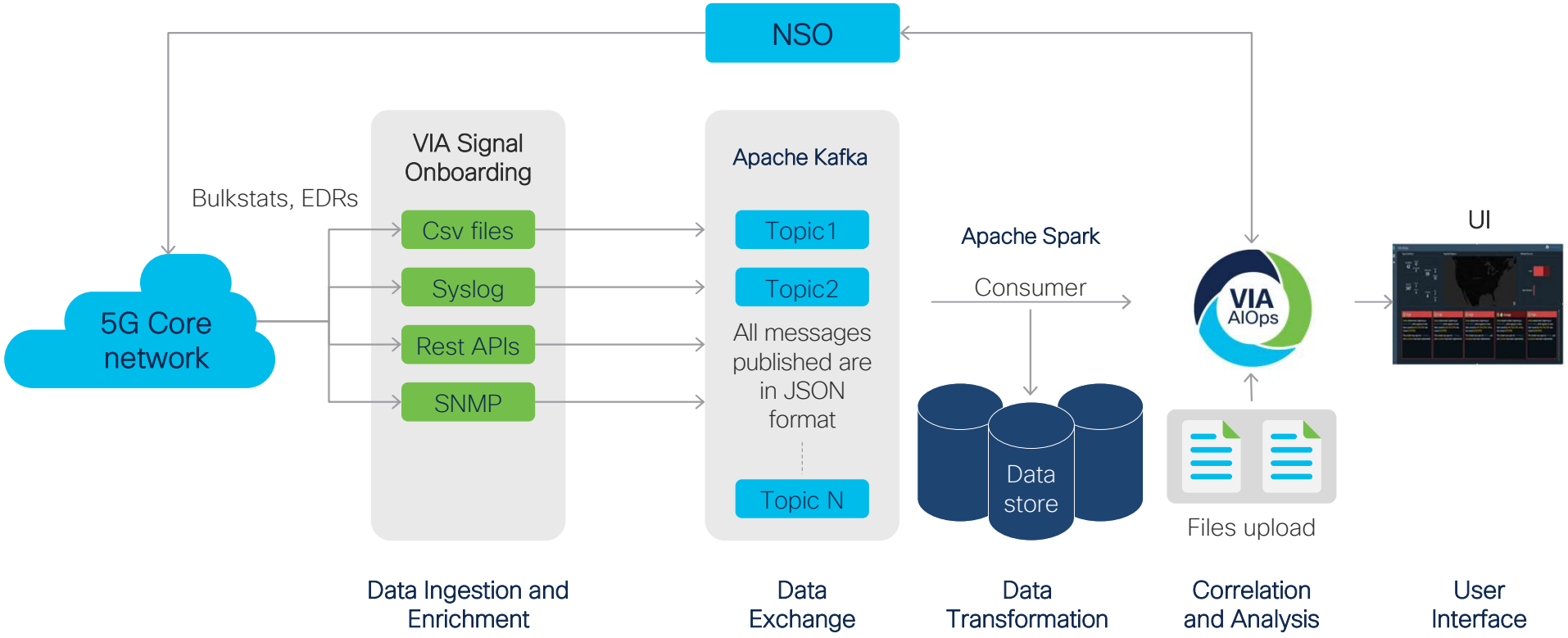
Reduction
in augmented staff

Lower
tool license cost

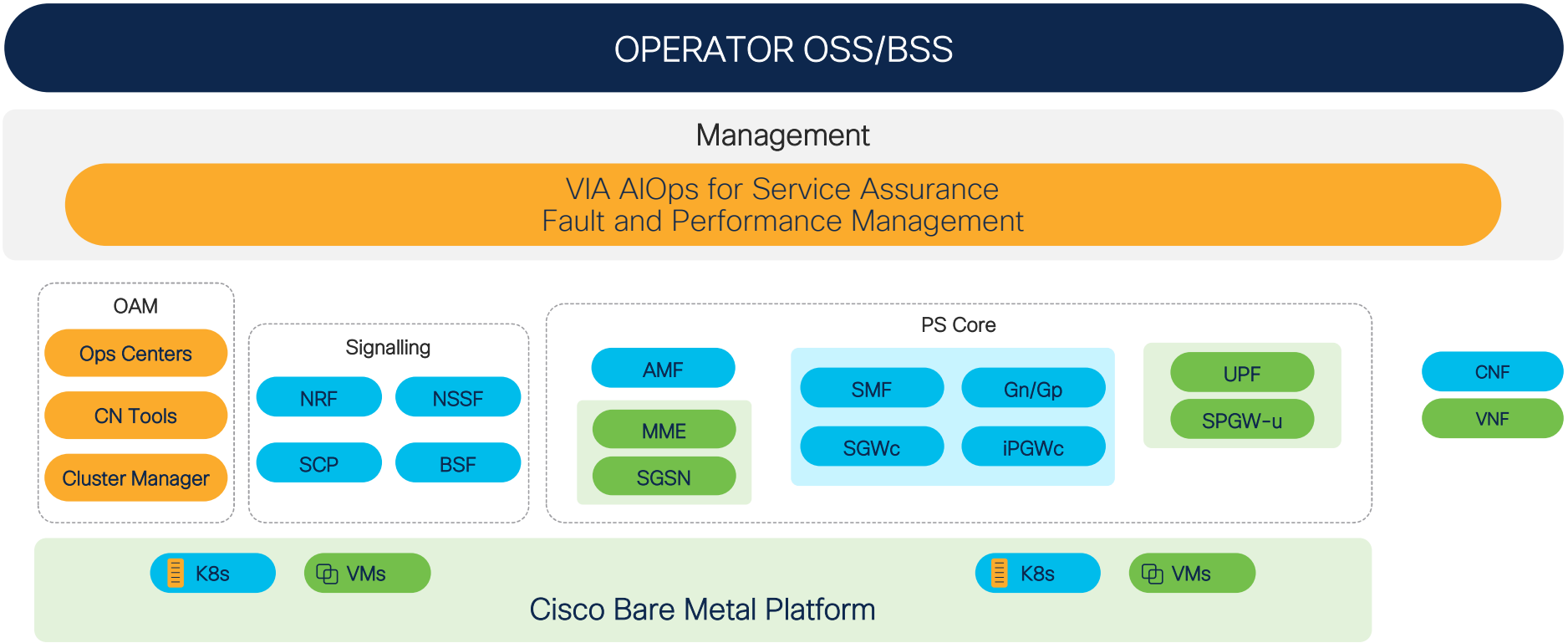
VIA AIOps end-to-end service assurance architecture

Full stack observability	Across service layers supporting fault, performance, and change management processes	Intuitive Persona Based User Interface	Dynamic Ad Hoc Analysis 	Model generated dashboards and views within minutes
AI, machine learning and advanced analytics	Ontology and Topology System Discovery and Correlation Analysis	Advanced Anomaly Detection with continuous learning of seasonality in load and usage	Affinity Analysis Beyond Temporal Correlation	AI Signal Lab generates what if analysis in seconds
Real-time analytic pipeline	Ingest →	Contextualize and Correlate →	Reduce Noise →	Group Signals into Incidents →	Root Cause Analysis →	Notify and Act
Unified data collection	Cloud-Native Environments ✓	Metrics, Logs, Events and Traces ✓	MIB data with automatic capture and prep ✓	Historical Events, Diagnostics, and Actions ✓	Customer Support Data ✓	
Open core foundation	Scale to billions of analyzed data points with mission critical availability Built on best-of-breed open-source tools …. HDFS, Kafka, Spark, Druid, …					

VIA AIOps in a Cisco environment
5G Core



VIA AIOps in a Cisco environment
Fault and performance management

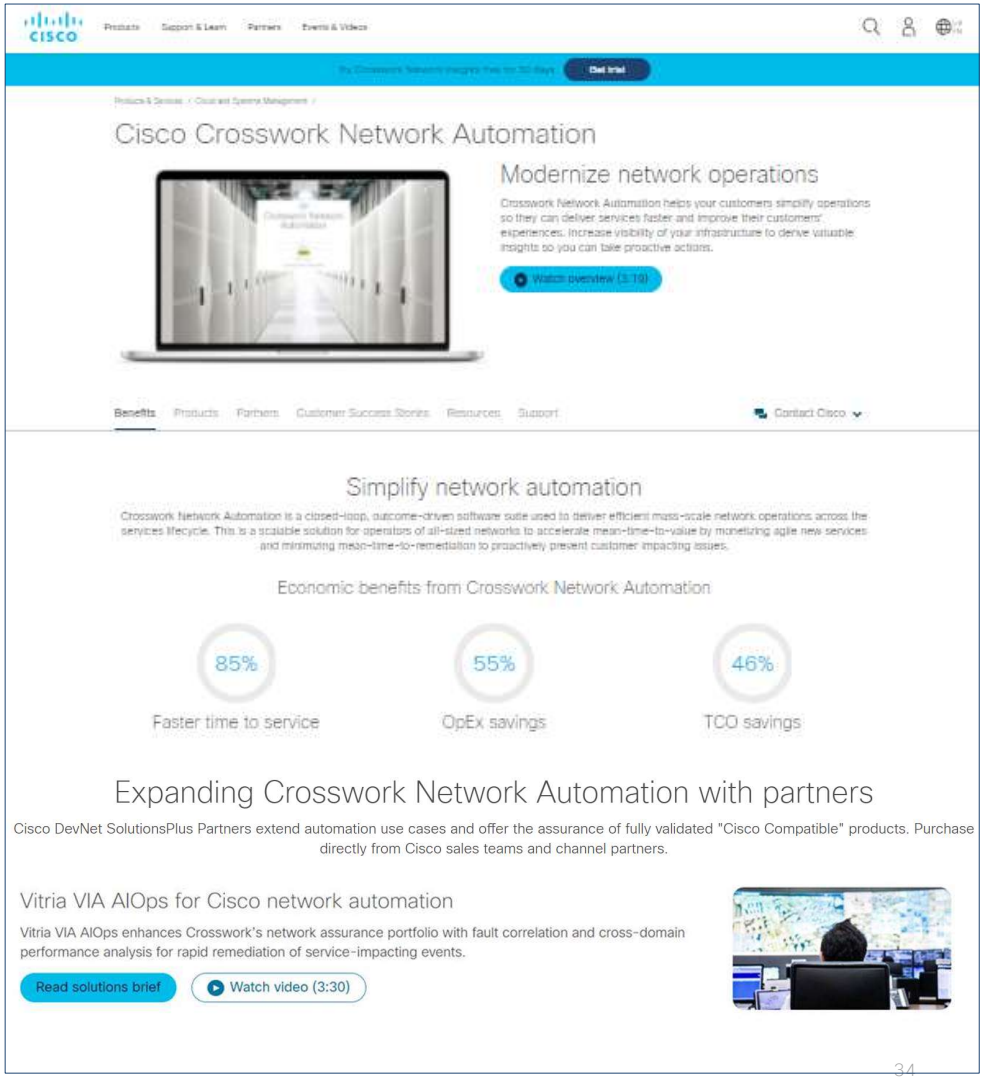


The VIA AIOps difference

1. Full-stack observability across compute, network, and applications
2. Fault, performance, and change management process optimization tied directly to customer experience
3. Faster MTTD and MTTR
   - Going beyond threshold setting
   - Discovering system ontology
   - Implementing affinity analysis beyond temporal correlation
   - Grouping signals to declare a single incident
4. Prescribed action with automation

For more information on Cisco's Automation portfolio and Vitria Via AIOps, please visit:

cisco.com/go/crosswork



Questions?

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